

**COURSE NUMBER**

FHWA-NHI-132040

COURSE TITLE**Geotechnical Aspects of Pavements**

This course covers the latest methods and procedures to address the geotechnical issues in pavement design, construction, and performance for new construction, reconstruction, and rehabilitation pavement projects. The course content includes geotechnical exploration and characterization of in-place and constructed subgrades; design and construction of subgrades and unbound layers for paved and unpaved roads, with emphasis on the American Association of State Highway Transportation Officials (AASHTO) 1993 empirical design procedure and on the new Mechanistic-Empirical Pavement Design Guide (MEPDG); drainage of bases, subbases, and subgrades and its impact on providing safe, cost-effective, and durable pavements; problematic soils, soil improvement, stabilization, and other detailed geotechnical issues in pavement design and construction; and construction methods, specifications, and QC/QA (quality control/quality assurance) inspection for pavement projects.

The goal of the course is for each participant to recognize the importance of the geotechnical aspects relevant to the design, construction, and performance of a pavement system. Participants will develop an appreciation for the importance of adequate subsurface exploration and laboratory characterization of subgrade soils as well as the requisite pavement design parameters for subgrades, unbound base and subbase layers, including drainage features. The course is designed to elicit maximum input from participants, particularly regarding an understanding of the impact of geotechnical features on the long-term performance of pavement systems.

NOTE TO PARTICIPANT: Please bring a calculator that can perform trigonometric, log, and other engineering calculations, a note pad, and a pencil.

NOTE TO HOST: For this course, the host is asked to identify a state speaker to conduct a host state presentation. The presentation is usually on the first day of the class and lasts approximately 25 minutes with an additional 15 minutes of discussion. The objective of the presentation is to communicate the state's current practices and experience to the course participants. The state representative should have experience in geotechnical pavement activities. A detailed list of issues to be addressed in the host presentation will be provided. Also for this course, the host is asked to secure at least 6 laptop computers to be used during team exercises. The host can request that at least 6 participants bring their laptops to the course. The machines must have Microsoft Excel (Office 97 or later) and the optional Solver add-in tool installed. Lastly, the host state is asked to complete a "Questionnaire on Geotechnical Practices in Pavement Design" and provide policies and special provisions for (1.) obtaining subsurface information and laboratory testing in relation to pavement design, (2.) pavement design along with any agency design guides, (3.) field construction monitoring for subgrade approval and pavement component approval as well as contractors QC requirements for pavement component construction.

OUTCOMES

Upon completion of the course, participants will be able to:

- Explain the geotechnical parameters of interest in pavement design and their effects on the performance of different types of pavements
- Explain the influence of climate, moisture, and drainage on pavement performance
- Identify and explain the impact of unsuitable subgrades on pavement performance
- Determine the geotechnical inputs needed for design of pavements, both for the AASHTO 93 empirical design procedure and the new MEPDG
- Evaluate and select appropriate remediation measures for pavement subgrades
- Explain the geotechnical aspects of construction specifications and inspection requirements
- Identify subgrade problems during construction and develop recommended solutions

TARGET AUDIENCE

Many groups within an agency are involved with different aspects of definition, design, use, and construction verification of pavement geomaterials. These groups include pavement design engineers, geotechnical engineers, materials engineers, specification writers, and construction engineers who are or will be involved in the design, evaluation, and construction (or reconstruction or rehabilitation) of pavements. This course was developed as a forum for these various personnel to work together to enhance current procedures for building and maintaining more cost-efficient pavement

structures.

TRAINING LEVEL: Basic

FEE: 2021: \$385 Per Person; 2022: N/A

LENGTH: 3 DAYS (CEU: 1.8 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

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